Central Valley Salmonid Satellite Project Work Team:
Juvenile Monitoring
Meeting Notes from November 15, 2006
Yolo Bypass Wildlife Area 10:30

Participants: Bill Poytress (Chair; USFWS), Jim Earley (USFWS), David Colby (USFWS), Dennis Blakeman (CDFG), Michelle Workman (EBMUD), Richard Corwin (USBR), Robert Vinck (CDFG), Joseph Johnson (CDFG), John Williams, Jeff Kozlowski (Jones & Stokes), and Douglas Threloff (USFWS).

I. Introductions and Announcements: Welcome newest participant Douglas Threloff (FWS-Sacramento), the new coordinator of the Comprehensive Assessment and Monitoring Program (CAMP).

* John Williams' white paper (+500 pages) titled "Central Valley Salmonids" should be available through the San Francisco Estuary and Watershed Science online journal in approximately one month. Check the website periodically for this notable work http://repositories.cdlib.org/jmie/sfews/all_issues.html

Ia. Reminder: Updating the Central Valley Salmon and Steelhead Existing Monitoring Programs' Summary.

B. Poytress asked the group to remember to read over the summary as it pertains to the program managers' projects and provide Alice Low with updated information, if applicable, as soon as possible. Alice can be reached at alow@dfg.ca.gov The summary is available at: http://www.dfg.ca.gov/nafwb/pubs/2005/CV_MonitoringPrograms.pdf

II. Modify/Adopt agenda – No Comments.

III. Modify/Adopt draft meeting notes from 8/16/06 - The previous meeting notes were adopted with no further comments. Thanks for the input.

IV. Group Discussion Topic: ***Mark-Recapture Techniques: Similarities and Differences noted using hatchery and wild salmonids to estimate gear efficiency***.

To begin the discussion **B. Poytress** disseminated a brief overview he created of the 1996 Roper and Scarnecchia (reference below):

Differences noted in Roper and Scarnecchia (1996) concerning wild and hatchery fish behavior as it relates to trap efficiency studies

*Sampling data results suggest hatchery fish moved during the day; wild fish not detected during day samples. NOTE this violates the assumption of similar behavior between hatchery and wild fish (Ricker 1975).

*TE using hatch or wild did not differ when trap placed in swift areas (i.e. high velocity at the head of a pool).
*TE DIFFERED SIGNIFICANTLY when trap placed in middle and foot positions (i.e. lower velocity areas).

*Hatchery fish migrate facing into the current in swift water but faced downstream in moderate to slow velocity water; likely resulted in trap avoidance by hatch (wild not observed via snorkel because they moved at night).

*Consistent trap efficiencies for wild fish moving at night suggest trap avoidance not a problem during low light conditions (e.g. night or turbid conditions?).

*Hatchery fish averaged 78.7 mm.
*Wild fish averaged 66.6 mm.
* Size difference may have allowed hatchery fish to avoid capture.

**Applying efficiency values based on hatchery origin fish mark-recapture trials conducted in low to medium velocity water would greatly underestimate efficiency of wild fish and consequently would greatly overestimate the population passing the transect.

**Differences in trap efficiency values for hatchery and wild fish likely related to diel migration timing and fish size as well as velocity.

**Estimates of trap efficiency for wild and hatchery origin fish should be calculated independently until site specific evidence proves otherwise (i.e. conduct trials using both fish types to see if similarities or differences exist in terms of trap efficiency).

CONCLUSIONS and RECOMMENDATIONS

*Conduct trials using wild fish whenever possible.
*Perform paired releases of like sized wild and hatchery fish under a variety of conditions (e.g. a variety of flows, fish sizes, sample site conditions, day and night releases).
*Place trap in such a way as to get similar, consistent results if using hatchery fish (site selectivity).
*Consider results mentioned above and what your goals are as it relates to what you capture (e.g. Test efficiency with representative captures annually).

From the above discussion points it was noted that most juvenile monitoring groups use Chinook sampled from their traps for trials. Some have tried using fish captured by seines, Kodiak trawls or hoop nets. Concerns were noted with respect to seined fish that may not be actively emigrating and thus may not be good surrogates. It was noted that it may be interesting to perform paired releases of tributary sampled fish with Mainstem sampled fish to conduct Mainstem river efficiency experiments as well as additional paired releases of hatchery and wild salmonids.

Most believed that using fish previously sampled from traps would be representative of out-migrating salmon (in terms of size and behavior) and would therefore be superior to hatchery fish who appear to exhibit differing behavioral emigration patterns (e.g. movement during the day and orientation during down stream migration). It was noted that trap site selection (placement) may have a considerable effect on efficiency, as described in Roper and Scarnecchia (1996).

Discussion related to methods to compare orientation of juvenile salmonids moving at night ensued. It was mentioned that perhaps the technology used for the Delta Cross Channel studies (videography) may be applicable to find out more about the orientation (upstream or downstream) of juvenile salmonids as they emigrate.

EBMUD biologists performed limited paired release experiments using hatchery and wild fish in 2001. The paired release groups were released during day and night time hours. It was noted that there were only slight differences in efficiency values (i.e. not significant). Higher efficiency values were documented for hatchery fish released at night, albeit slightly. Differences were attributed to disorientation of hatchery fish released at night at the release location. Typically, the Mokelumne trap catches few wild fish (<10,000 / year) and hatchery fish are the only alternative to conduct mark recapture trials throughout the emigration period.

Merced hatchery fish have normally been used for experimental purposes (i.e. not a production facility). Salmon produced there have been used for mark-recapture trials for Merced, Tuolumne and Stanislaus. Efficiency values have been highly variable (1% – 16%) likely due to predation and the low to medium velocity of trap sampling areas [corresponds well to results found by Roper and Scarnecchia 1996].

The Clear Creek sampling location conducted trials in the spring of 2004 using 50-70mm fish and repeatedly derived efficiency values of 15%-20% which appeared contrary to the standard literature concerning trials using fish of this size class (i.e. trap avoidance usually an issue with larger fish).

V. Next Meeting Information: Tentative Date set as Wednesday February 21, 2007.

Discussion topic to be focused on *Genetic Information Derived from Juvenile Fish Monitoring Programs' Sampling.* All, please bring information related to genetic sampling methods used, results of genetic sampling, and future ideas for genetic sampling of juvenile fish (and their associated benefits).

References:

Ricker, W. E. 1975. Computation and interpretation of biological statistics of fish populations. Bull. Fish. Res. Board Can. No. 191.

Roper, B., and D. L. Scarnecchia. 1996. A Comparison of Trap Efficiencies for Wild and Hatchery Age-o Chinook Salmon. North American Journal of Fisheries Management 16: 214-217.